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ON THE BREEDING HABITS OF *DENDROICA VIGORSII* AT RALEIGH, NORTH CAROLINA.

BY C. S. BRIMLEY.

THE PINE WARBLER—our commonest Warbler—during the breeding season frequents only pine woods and mixed woods containing pines as well as any isolated groups of pine trees; but at other times of the year it is not so exclusive, being often found as far from the neighborhood of pines as is possible in this locality.

This species feeds on insects and their larvæ, but like all our resident species consumes a large amount of vegetable food during the winter, *e. g.*, the seeds of the short-leaved and loblolly pines (*Pinus mitis* and *P. taeda*) as well as the berries of dogwood (*Cornus florida*) and sumac (*Rhus copallina*). During the spring and summer this species feeds mostly in the pine trees; during autumn and winter it also feeds on the ground to a great extent, and may then be found almost anywhere.

The Pine Warbler begins breeding quite early, the dates of finding the first nest (in each case about a day or two old) being March 27, 1888, March 27, 1889, March 3, 1890. The time occupied in building the nest and laying the four eggs is fourteen days, provided the weather is favorable; spells of bad weather such as cold rains or snow, or high and cold winds, usually cause building operations to be suspended for the time being, but this seems to vary with individual birds. In March, 1890, I had six nests under observation when a spell of bad weather came on; three were deserted; one furnished a fresh set in twenty-five days from first finding; one, a single fresh egg seventeen days from finding; and one, a set containing small embryos at the end of nineteen days; the latter nest must have been completed without interruption, although in quite an exposed situation. Nests in an advanced stage of construction do not seem to be often deserted; but when only just commenced, a bad spell of weather usually causes the birds to quit.

The female Pine Warbler gathers material from the trunks and limbs of trees and from the ground, and from both near the nest and as far as several hundred yards. She usually betrays her occupation by her business-like air and methods. She usually flies toward the nest in a straight, business-like flight, but as

a rule alights in the next tree before coming to the nest, or else in a tree beyond, and then hops down to the nest in a desultory sort of way, seldom going at once to the tree the nest is in. The female does most of the building, but on one occasion we observed the male assisting her. As a rule, however, he merely accompanies her in her journeys, keeping a little way off and singing assiduously his own individual song. The song of the Pine Warbler varies within certain limits, the usual song being very different from a nuptial song which is used only in the breeding season and by one fourth or less of the males.

The nest is always placed in a pine, the two species (*Pinus mitis* and *P. taeda*) being used about equally, but the situation varies a good deal. It may be on a horizontal limb, or built among the small twigs toward the end of a limb; in whichever position, it is put there to stay and takes a good deal of pulling to get it away. It may be close to the trunk or as far off as fifteen feet. The height too varies from twelve to eighty feet, the usual height being from thirty to fifty feet. The nest is solid and deep. It is constructed of weed stems, horsehair, and grapevine bark, and is thickly lined with horsehair and feathers. The dark-colored grapevine bark on the outside gives it an appearance characteristic of this species. A good deal of caterpillar silk also is used, as well as small cocoons, in its construction.

The eggs generally are four, sometimes three, and very rarely five. Four is the usual set for the second and third laying as well as for the first, while three seems usually to be the result of bad weather, as we have taken second sets of four from birds that had previously laid three. When one nest is taken, this species immediately builds another nest and lays another set, which I believe from my observations to be an almost universal trait among our small land birds.

The female incubates as a rule, but we have on several occasions found the male on the nest. When the eggs are taken the female usually tries the broken wing dodge. The majority of breeding females are in the dull plumage with little or no yellow below; a few, however, are bright yellow below and not much duller than the males, which renders it difficult in such cases to distinguish the sexes.

To conclude, I may state that the above observations are the result of watching the construction of over fifty nests of this species, thirty of which I found last year.